

WHAT IS CLAIMED IS:

1. A system for creating a still image of a target object by utilizing a video camera, comprising:

- 5 a support device configured to transport said video camera across said target object during a scanning procedure; and  
a scanning manager coupled to said video camera for analyzing scan motion data from said scanning procedure, and responsively generating still frames corresponding to said target object.

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2. The system of claim 1 wherein a stitching software program combines said still frames to produce said still image, said stitching software program residing on one of said video camera and an external computer device.

- 15 3. The system of claim 1 wherein said target object includes one of a document, a photographic image, a physical object, a graphics image, and a geographic location.

4. The system of claim 1 wherein a motion detector generates said scan motion data by monitoring said support device during said scanning procedure, said scan motion data including at least one of a scan speed and a scan direction.

- 25 5. The system of claim 1 wherein said support device includes a cradle that is initially positioned at a starting index of a scan track to allow said video camera to frame said target object using at least one of a focus mechanism and a zoom mechanism.

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6. The system of claim 5 wherein a system user enters scan parameters into said video camera for performing said scanning procedure, said scan parameters including at least one of a scan speed control, a scan direction control, a still frame time interval control, a scan overlap control, and a scan resolution control.

7. The system of claim 6 wherein said video camera generates an error warning on a user interface when said system user enters an invalid scan parameter, said invalid scan parameter including a negative overlap setting which would cause said still images to be aligned in excess of a minimum adjacent still image overlap value.

8. The system of claim 5 wherein said cradle begins traveling along said scan track during said scanning procedure, said video camera responsively beginning to capture and store video data that corresponds to said target object.

9. The system of claim 8 wherein a display manager in said video camera displays an active scan mode indicator on a user interface of said video camera during said scanning procedure, said active scan mode indicator displaying user settings for said scan parameters.

10. The system of claim 8 wherein said video camera captures said video data using at least one of a complete video frame format in which a series of sequential video frames each contain a complete pixel set, and a keyframe format in which a series of keyframes that contain said complete pixel set are separated by a series of difference frames which contain only altered pixels which are different from a corresponding one of said keyframes, each of said keyframes being generated when an altered pixel total exceeds a pre-determined threshold value.

11. The system of claim 8 wherein a motion detector captures scan motion data corresponding to movements of said video camera, said motion detector providing said scan motion data to said scanning manager of said video camera, said scan motion data including at least one of a scan speed and a scan direction.

12. The system of claim 11 wherein said motion detector generates said scan speed by monitoring a rotational velocity sensor for at least one wheel upon which said cradle travels during said scanning procedure.

13. The system of claim 11 wherein said scan speed is expressed by a formula:

$$\text{Scan Speed} = \text{Non-Overlapped Scan Distance} / \text{Time Interval}$$

where said Non-Overlapped Scan Distance is a length of a non-overlapped region of an immediately-preceding still frame prior to a start of a current still frame, and said Time Interval is a length of time required by said cradle to transport said video camera across said Non-Overlapped Scan Distance to said start of said current still frame.

14. The system of claim 11 wherein said scanning manager extracts an initial still frame of said target object from said video data that is captured by said video camera during said scanning procedure.

15. The system of claim 14 wherein said scanning manager extracts a current still frame of said target object from said video data at a pre-determined time interval during said scanning procedure.

16. The system of claim 15 wherein said scanning manager determines an overlap region between said initial still frame and said current still frame by referencing said scan motion data.

17. The system of claim 16 wherein said scanning manager calculates an overlap length for said overlap region according to a formula:

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$$\text{Overlap Length} = \text{Still Frame Length} - \text{Non-Overlapped Scan Distance}$$

where said Overlap Length is a distance from a start of said overlap region to an end of said overlap region, said Non-Overlapped Scan Distance is a length of a non-overlapped region of said initial still frame prior to a start of said  
10 current still frame, and Still Frame Length is a constant length of one of said still frames.

18. The system of claim 16 wherein a stitching software program combines said video data in said overlap region between said initial still frame and said  
15 current still frame to provide greater image detail and increased image resolution, said stitching software program thereby generating a composite still image of said target object from said initial still frame and said current still frame.

20 19. The system of claim 1 wherein said video camera performs at least one of a reiterative combination procedure and concurrent combination procedure, said reiterative combination procedure repeatedly combining an immediately-preceding one of said still frames and a current one of said still frames to generate said still image, said concurrent combination procedure  
25 concurrently combining a series of said still frames to generate said still image.

20. The system of claim 1 wherein said scanning procedure is performed by one of a moving video camera process, a moving target object process, and a  
30 stationary camera-stationary target process that utilizes a moving scanning reflector element.

21. A method for creating a still image of a target object by utilizing a video camera, comprising the steps of:

transporting said video camera across said target object with a support device during a scanning procedure;

5 analyzing scan motion data from said scanning procedure with a scanning manager; and

generating still frames corresponding to said target object by utilizing said scanning manager.

10 22. The method of claim 21 wherein a stitching software program combines said still frames to produce said still image, said stitching software program residing on one of said video camera and an external computer device.

15 23. The method of claim 21 wherein said target object includes one of a document, a photographic image, a physical object, a graphics image, and a geographic location.

20 24. The method of claim 21 wherein a motion detector generates said scan motion data by monitoring said support device during said scanning procedure, said scan motion data including at least one of a scan speed and a scan direction.

25 25. The method of claim 21 wherein said support device includes a cradle that is initially positioned at a starting index of a scan track to allow said video camera to frame said target object using at least one of a focus mechanism and a zoom mechanism.

26. The method of claim 25 wherein a system user enters scan parameters into said video camera for performing said scanning procedure, said scan parameters including at least one of a scan speed control, a scan direction control, a still frame time interval control, a scan overlap control, and a scan resolution control.

27. The method of claim 26 wherein said video camera generates an error warning on a user interface when said system user enters an invalid scan parameter, said invalid scan parameter including a negative overlap setting which would cause said still images to be aligned in excess of a minimum adjacent still image overlap value.

28. The method of claim 25 wherein said cradle begins traveling along said scan track during said scanning procedure, said video camera responsively beginning to capture and store video data that corresponds to said target object.

29. The method of claim 28 wherein a display manager in said video camera displays an active scan mode indicator on a user interface of said video camera during said scanning procedure, said active scan mode indicator displaying user settings for said scan parameters.

30. The method of claim 28 wherein said video camera captures said video data using at least one of a complete video frame format in which a series of sequential video frames each contain a complete pixel set, and a keyframe format in which a series of keyframes that contain said complete pixel set are separated by a series of difference frames which contain only altered pixels which are different from a corresponding one of said keyframes, each of said keyframes being generated when an altered pixel total exceeds a pre-determined threshold value.

31. The method of claim 28 wherein a motion detector captures scan motion data corresponding to movements of said video camera, said motion detector providing said scan motion data to said scanning manager of said video camera, said scan motion data including at least one of a scan speed  
5 and a scan direction.

32. The method of claim 31 wherein said motion detector generates said scan speed by monitoring a rotational velocity sensor for at least one wheel upon which said cradle travels during said scanning procedure.

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33. The method of claim 31 wherein said scan speed is expressed by a formula:

$$\text{Scan Speed} = \text{Non-Overlapped Scan Distance} / \text{Time Interval}$$

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where said Non-Overlapped Scan Distance is a length of a non-overlapped region of an immediately-preceding still frame prior to a start of a current still frame, and said Time Interval is a length of time required by said cradle to transport said video camera across said Non-Overlapped Scan Distance to  
20 said start of said current still frame.

34. The method of claim 31 wherein said scanning manager extracts an initial still frame of said target object from said video data that is captured by said video camera during said scanning procedure.

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35. The method of claim 34 wherein said scanning manager extracts a current still frame of said target object from said video data at a pre-determined time interval during said scanning procedure.

30 36. The method of claim 35 wherein said scanning manager determines an overlap region between said initial still frame and said current still frame by referencing said scan motion data.

37. The method of claim 36 wherein said scanning manager calculates an overlap length for said overlap region according to a formula:

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$$\text{Overlap Length} = \text{Still Frame Length} - \text{Non-Overlapped Scan Distance}$$

where said Overlap Length is a distance from a start of said overlap region to an end of said overlap region, said Non-Overlapped Scan Distance is a length of a non-overlapped region of said initial still frame prior to a start of said  
10 current still frame, and Still Frame Length is a constant length of one of said still frames.

38. The method of claim 36 wherein a stitching software program combines said video data in said overlap region between said initial still frame and said  
15 current still frame to provide greater image detail and increased image resolution, said stitching software program thereby generating a composite still image of said target object from said initial still frame and said current still frame.

20 39. The method of claim 21 wherein said video camera performs at least one of a reiterative combination procedure and concurrent combination procedure, said reiterative combination procedure repeatedly combining an immediately-preceding one of said still frames and a current one of said still frames to generate said still image, said concurrent combination procedure  
25 concurrently combining a series of said still frames to generate said still image.

40. The method of claim 21 wherein said scanning procedure is performed by one of a moving video camera process, a moving target object process, and  
30 a stationary camera-stationary target process that utilizes a moving scanning reflector element.



41. A computer-readable medium comprising program instructions for creating a still image with a video camera, by performing the steps of:  
transporting said video camera across said target object with a support device during a scanning procedure;  
5 analyzing scan motion data from said scanning procedure with a scanning manager; and  
generating still frames corresponding to said target object by utilizing said scanning manager.

10 42. A system for creating a still image of a target object by utilizing a video camera, comprising:  
means for transporting said video camera across said target object during a scanning procedure;  
means for analyzing scan motion data from said scanning procedure;  
15 and  
means for generating still frames corresponding to said target object.